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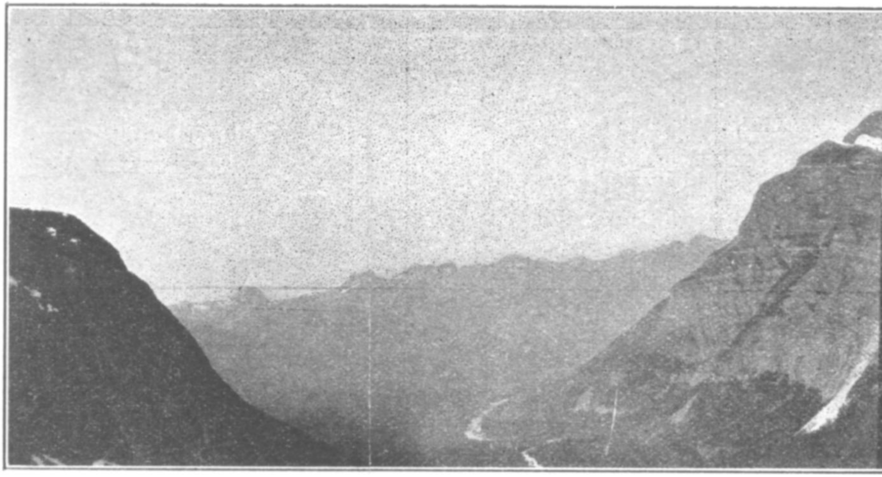


FIG. 1—Panoramic view of the massif of Mt. Kitchi, looking north-north

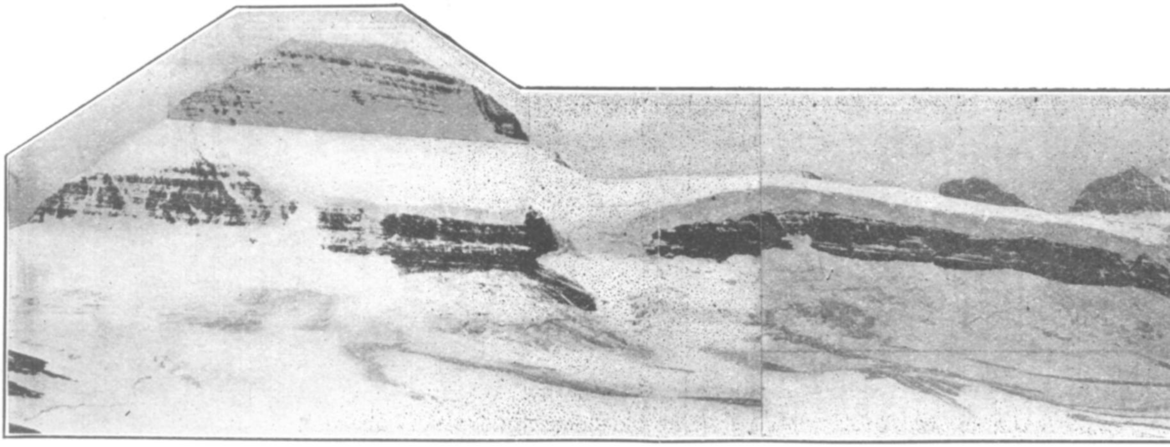
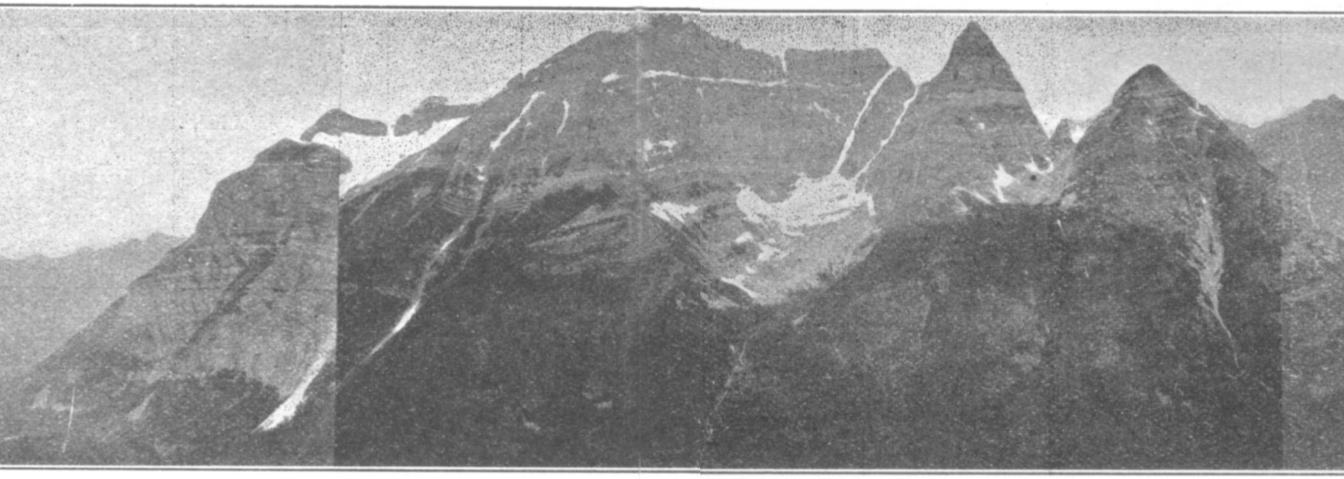
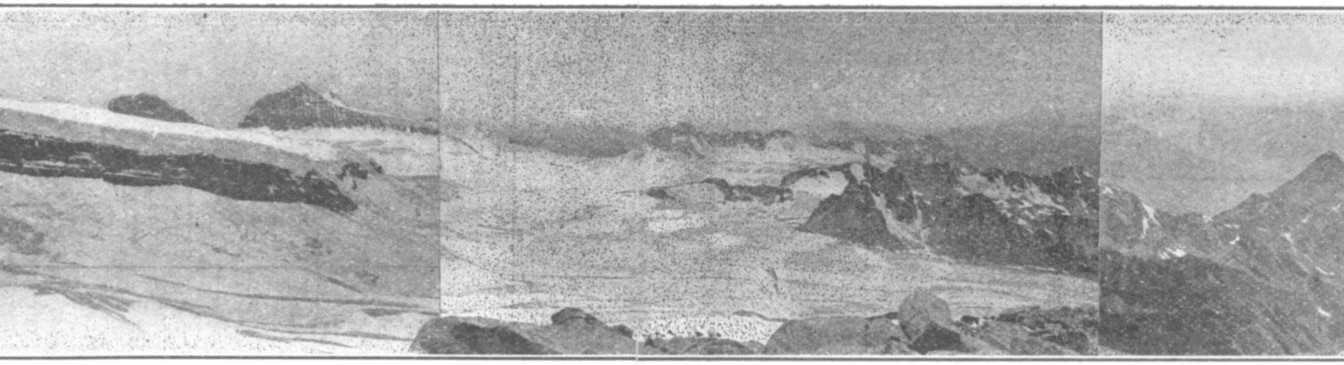


FIG. 2—Panoramic view of the northwest face of Mt. Kitchi taken from a poi
into which the long, flowing



massif of Mt. Kitchi, looking north-northwest from across the valley of the Big Salmon. **The main peak does not show in this view: it should appear above the ce**



est face of Mt. Kitchi taken from a point 7500 ft. in altitude at the north base of the main peak. The view extends from south-southwest to north-northw
into which the long, flowing glacier in the left foreground drains, probably leads to the branch of the Big Salmon descending from Jarvis Pass.

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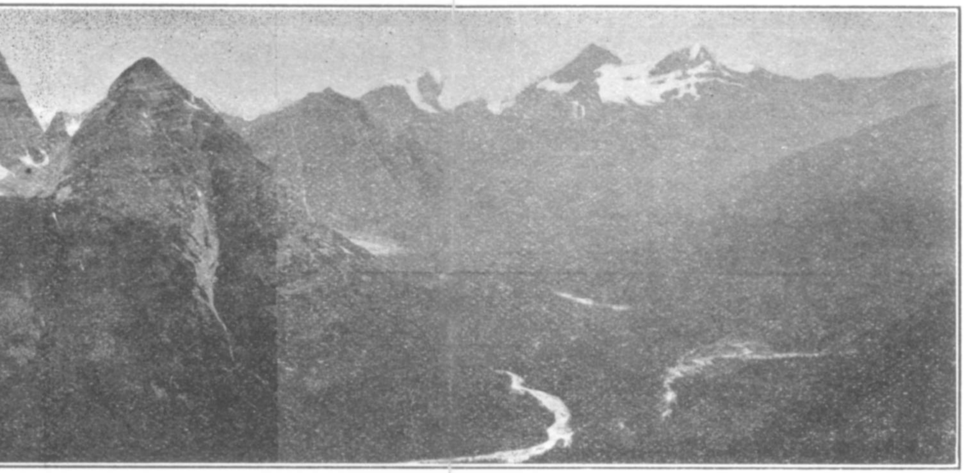
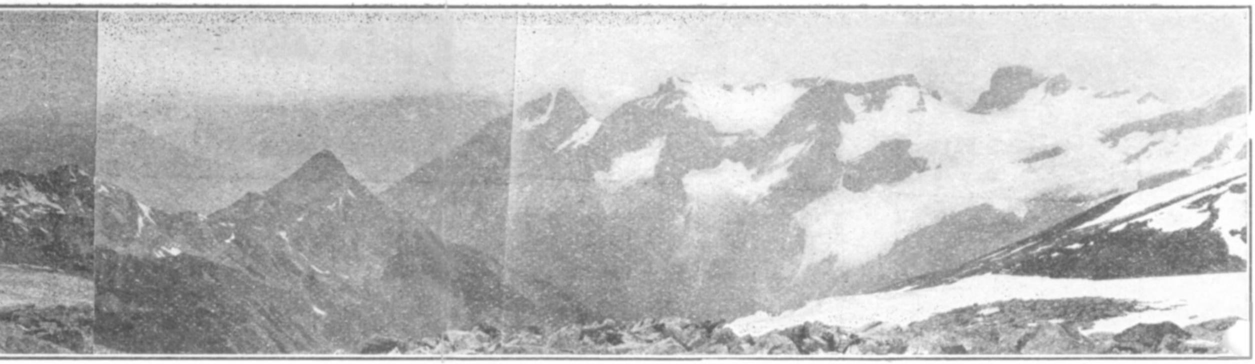


Photo by Mary L. Jobe. *Copyright*, 1914.

n this view: it should appear above the central amphitheater, as shown on Fig. 6.



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s from south-southwest to north-northwest. The deep valley in the right foreground, g Salmon descending from Jarvis Pass.

BULLETIN

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AMERICAN GEOGRAPHICAL SOCIETY

VOL. XLVII 1915 No. 7

MT. KITCHI: A NEW PEAK IN THE CANADIAN ROCKIES*

By MARY L. JOBE, A.M., F.R.G.S.

(Map facing p. 496.)

During six weeks of the past summer (1914) I made an expedition into the Canadian Rockies of Alberta and British Columbia, northwest of Mt. Robson. My companions were Miss Margaret Springate, of Winnipeg, a member of the Canadian Alpine Club; Donald Phillips, the chief guide of the expedition, who in 1909, with the Rev. G. B. Kinney, made the first ascent of Mt. Robson; and a second guide, Bert Wilkins. We explored an area near the continental divide between 118¾° and 120¼° W. longitude and between 53° and 54° N. north latitude. Our point ''farthest north'' was on the watershed of Fraser tributaries about 85 miles in an air line northwest of Robson station, and, by trails largely of our own making, nearly twice that distance.

On July 30th we left Grant Brook station on the Grand Trunk Pacific Railway. We traveled with an outfit of four saddle horses and four pack horses along the Moose River, a three days' journey to Moose Pass. From Moose Pass on August 2nd we climbed Mt. Pamm,[1] an easy snow peak less than 10,000 feet, and situated 12 miles north-northeast of Mt. Robson. Here on the summit with the aid of glasses we had our first glimpse of Mt. Kitchi. It rose a great, white pyramid, shining out through the distant haze to the northwest, and lifting its glaciated head far above the black peaks of its immediate environment. During the past year or so the existence and exact location of this "Big Mountain" have been matters of much interest to alpinists familiar with the Mt. Robson country. This peak was our summer's quest.

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* All the photographs were taken by the author; copyright, 1914.

[1] Name not confirmed by the Geographic Board of Canada.

Our compass bearings showed the "Big Mountain" to be almost on an exact northwest line from Mt. Robson and also on a line with Mt. Bess[2] and Mt. Chown.[2] These last-named peaks are about 20 miles north-northwest of Mt. Robson. These readings from Mt. Pamm served as our guide during the early part of the trip. It was impossible to estimate at this time the distance of the peak north of Mt. Robson. It seemed perhaps 80 to 90 miles away, but that was a mere conjecture.

In the days of the early survey a Grand Trunk Pacific engineer named Jones traveled along the continental divide from the northeast, approximating the location of the mountain as well as Fraser tributaries from the divide itself. The "Big Mountain" had been seen by Prof. J. Norman Collie and Mr. A. L. Mumm at the time of their ascent of Mt. Bess in 1911. Fred Stevens, a pioneer, in company with two other men, had reported in 1912 the existence of a big snow mountain which they had seen while locating timber limits on one of the northern tributaries of the Fraser. The same year Mr. S. P. Fay of Boston had seen the peak from the headwaters of the Porcupine. The summer of 1913 members of the Canadian Alpine Club—Donald Phillips and others—had seen a great, white peak while climbing on and about Mt. Robson. However, so far as we were able to secure information from the Canadian authorities, no one except Donald Phillips had attempted to explore the region lying northwest of Mt. Bess in the Fraser watershed. In 1912 and 1913 he had explored the Beaver in the Fraser Watershed, and also the Big Smoky and the Jack Pine rivers in the Peace watershed and had made a sketch map of that region.

With this information as our basis we left Robson Pass camp August 7th and started north along the Big Smoky, a large tributary of the Peace, which heads in the Robson glacier. The first four days out there was a trail extremely rough but more or less distinct down the Smoky, up Bess Pass, where our aneroid registered 5,500 feet, over Bess Shoulder, 6,400 feet, and up Jack Pine Pass, 6,500 feet, to the headwaters of the Jack Pine. Old Salamo, an intelligent Indian from Grand Cache, had hunted in these regions years before and he had an engineer's eye for routes of least resistance, though portions of them lay over snow-line passes. However, the descent on the north side of Jack Pine Pass was the steepest place I had at that time ever seen horses traverse. With goatlike sureness of foot the cayuses zigzagged down a 40 degree slope at a terrific speed, marvellously maintaining their balance. It was exciting, but the return trip across Jack Pine Pass four weeks later seemed an every-day occurrence. We had learned something in that interval.

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[2] Names not confirmed.

The vista down the Jack Pine is one which memory will always picture. To the east the glaciated walls of Mt. Bess and Mt. Chown rise perpendicularly from the long sloping banks of the river. From these ice masses wild, swollen streams fall to the valley below. To the west is a long range of wooded mountains with many gleaming waterfalls shining out against a dark background of spruce and jack pines. Topping this ridge is a vast stretch of flower-filled alpland dotted with many lovely dark lakes. The Jack Pine itself is a curious stream. When our horses forded it, we noticed two distinct streams of water, the one white and muddy rushing from the glaciers on the east side; the other clear and blue pouring from the little lakes and waterfalls on the west side of the valley.

Beyond our Jack Pine camp at the foot of the pass, the only trail is a snow-shoe trail which Phillips and Frank Doucette, his trapping partner, made in 1911. About an hour down the Jack Pine we came to one of their old caches where we expected to find flour, rice, and butter, but the robber wolverenes had destroyed everything to the last morsel. This was a considerable loss to us and put us on rations much more quickly than we had anticipated.

Beyond the head of the Jack Pine we had fearful going. For hours we waded on foot through muskeg too soft to hold up our horses; we plunged through streams up to our knees, and then fell through thickets of alders twelve feet high. The rain beat down steadily and we were steaming hot under our rubber coats, and at the same time drenched to our waists. After ten maddening hours of trail cutting and muskeg, we made camp on a little island surrounded by two channels of the river. There was no brush for our beds and the firewood had to be chopped on the other side of the river and carried across.

The next day we followed a well-defined game trail filled with hundreds of tracks of moose, caribou and bear. As we left the valley of the main Jack Pine and struck for the head of the Middle-

Fork, the ridges became very steep and the undergrowth extremely dense, the nearer we approached the British Columbia line. Gnarled and twisted spruce and jack pines and willow scrub filled the lower valleys. Higher up on the mountain sides we encountered rhododendron thickets so compactly massed and inclined downward by the pressure of the winter's snows that climbing against them was almost intolerable. When we reached the pass (Jones Pass), 6,200 feet, between the Middle Fork and the West Branch of the Jack Pine we were practically at the end of Phillips' knowledge of the country. It was necessary for us to locate, if possible, our peak, and get bearings and landmarks for the remainder of the journey. From our camp, Phillips and I climbed a nearby ridge to an observation peak, 7,600 feet according to the aneroid. Here we photographed the landscape on all sides. To the southeast Mts. Robson, Whitehorn, Resplendent, and Pamm (our first locating climb) were plainly visible; west of northwest two black peaks (we called them the Black Twins) were prominent in the foreground. Our course was correct, for the Big Mountain, now much farther off than Mt. Robson, we saw quite distinctly north of northwest of these twin peaks. For several days succeeding, as our course was to the north of these peaks, they continued to be an unmistakable landmark. From our Jones Pass peak station the Big Mountain, with its great snow and ice abutments, was more prominent than any other feature of the northern landscape. Great tumbling glaciers everywhere surrounded it. The summit seemed a long, knife-like arête with a long slope to the southwest and another to the northeast. Through the glasses the south face appeared extremely difficult. As is usually the case in these ranges, we found the north face equally difficult. From this station all the main ranges lie northeast and southwest. There were only four ranges visible to us between Jones Pass and the Big Mountain. Instead we crossed eight later on and at this point we were less than half way.

We were in the midst of wild country. In the space of one hour we were within easy range of a black bear, a big bull moose, and a flock of mountain goats.

From Jones Pass we cut our way through dense woods down a steep declivity to broad open muskeg on the West Branch of the Jack Pine. After traveling about six miles through this meadow we came to a low pass, 5,300 feet, filled with beaver dams and houses. We named this pass Beaver Dam Pass. It separates Fraser and Peace waters. Another broad stretch of muskeg and we reached another pass, on which a huge avalanche of trees and rocks had descended. At Avalanche Pass our aneroid registered 5,300 feet. Our further progress was here checked by dense woods filled with an undergrowth of devils' club and rhododendron of the British Columbia variety. In fact, from here on every timbered ascent or descent meant most serious and exhausting exertion for both man and cayuse. I think it impossible to take cayuses over steeper, rougher places than we traversed during the remainder of our trip to the Big Mountain. The northern side of Jack Pine Pass, which had seemed a thrilling descent when we had crossed it several days before, now, in comparison with these British Columbia mountains, seemed like an hour's pastime.

There was no chance to move our outfit through such a maze. A less hardy and determined guide would have pronounced it the end of our journey. But for twelve long hours, Phillips and Wilkins cut out a trail over the mountain to a blue-green river, while Miss Springate and I, in true squaw fashion, prepared a wonderful dinner (it was the anniversary of Phillips' ascent of Mt. Robson) and kept the horses from straying from camp. The next day we moved our outfit over a mountain shoulder, 6,150 feet, and down to the 'East' Branch of the Little Smoky, 4,600 feet. The flats of the Little Smoky are filled with beaver houses, dams, trails half a foot deep and cuttings, while in the forest adjacent we found moose trails as well worn as any pack trail. In some places they were worn down two feet below the natural, mossy surface.

To cross the next mountain our men cut out twenty-four switchbacks in making three-quarters of a mile of trail—a twelve hours' job. The open Jack Pine forests of Alberta were indeed far away. We got up the switchback trail in one and one-half hours, and then struck alpland with a long ridge beyond. We found a pass at 6,400 feet near a beautiful crescent-shaped lake. We camped at tree line (5,900 feet) below "Crescent Lake Pass." From a peak north of the pass Phillips discovered another pass, and mapped out the morrow's route over alpland.

The weather had continued fine from the second day out. A brief thunderstorm at midnight at the Crescent Lake camp August 15th was followed by sharp, clear sunshine the next day, which showed us a fine wide pass across a 6,000 foot snow field to the north-east of our old landmarks, the Black Twins; we named this pass Eagle Pass. Golden eagles were flying about in great numbers and the ground was strewn with feathers. Before us stretched out a great alpine basin, probably fifteen square miles in area, presenting a wonderful vista of soft, sweet alpine grass, multi-colored alpine flowers, and low-growing balsams. Two miles beyond Eagle Pass we crossed a tributary of the 'West' Branch of the Little Smoky. Two miles beyond this stream we came to what seemed an easy pass—at 6,500 feet. As the other side proved to be only cliff, scree and rock-fall, we turned west, crossed two more alpine summits in four miles. The latter, at 6,400 feet, was snow filled, while the slopes leading up to this pass were blue with forget-me-nots. Below Forget-me-not Pass, we had four hours of maddening trail cutting down a rhododendron descent of 1,500 feet, so steep that the pack horses trod constantly upon each others tails. Once out of the dense timber, the sun beat down fiercely upon us. Through willow scrub we followed moose tracks so recent that where they crossed the stream the water was still muddy in their foot prints. After searching for hours for a camp ground and feed for our horses, we came at last upon a beautifully clear stream—another branch of the Little Smoky—and pitched our tents on an old Indian camp ground. The tepee poles were grass grown and rotten, left there years before doubtless by roving Crees who had come in from Grand Cache by the Muddy Water river. We called this stream Forget-me-not Creek, as it drains Forget-me-not Pass. It was reached, moreover, after a memorable day of hard trail work.

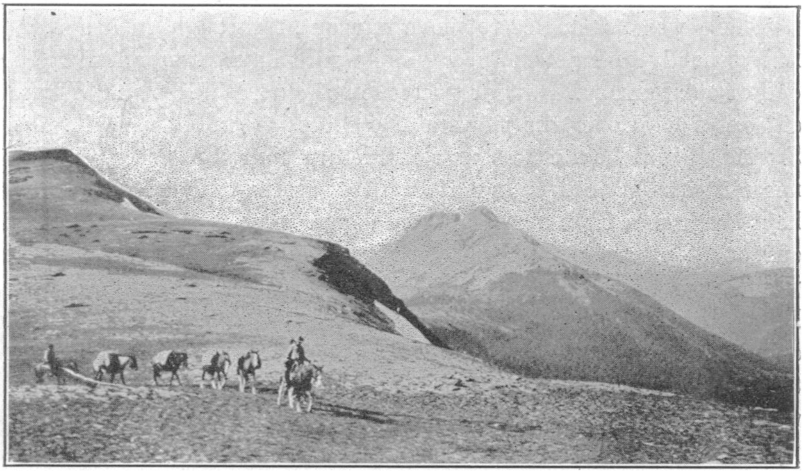

Fig. 3—Alpland above Avalanche Pass. Looking northwest.

The next day we crossed Forget-me-not Creek and traveled all day over rhododendron and scrub balsam ridges and side hills, coming at night to Last Hope Camp, 5,500 feet. There was grave doubt about our taking our horses any further as all of the ridges and passes were dropping off abruptly on the north side and our observations at Crescent Lake Pass had shown us still several days of hard travel from our objective point.

From a peak above Last Hope Camp Phillips discovered a pass to the northwest. The next day we took our outfit over the snow of Last Hope Pass, 6,000 feet, and down 1,500 feet over steep sliding shale. It was a perilous undertaking. Less skill in picking out the zigzag route or less sure-footed animals might have cost us the loss of a horse and, as a result, the defeat of our project. However, they had beaten out a trail over which they could return. It would have been impossible to have taken them up this shale slope without such a trail. Looking back at the mountain from two miles below, the route over which we had come seemed impossible. Our tracks, however, were easily discernible through the glasses.

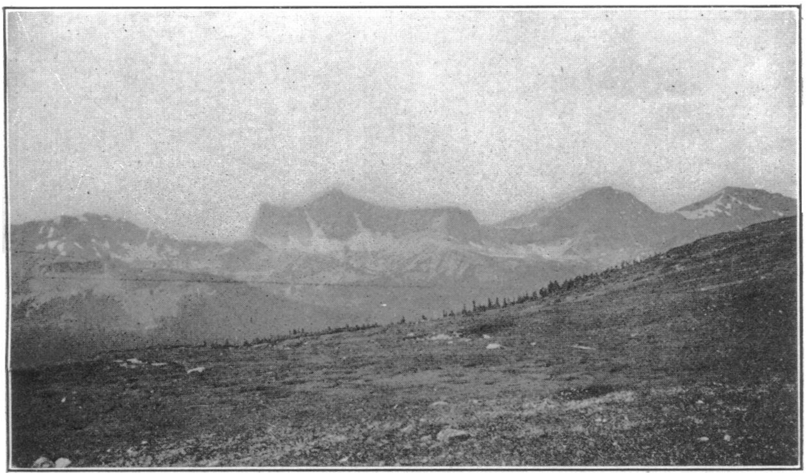

Fig. 4—The Black Twins. Looking west from north of Eagle Pass.

The next day we crossed three ridges, each of which still bore traces of snow, and afforded all the impediments of hard going of the usual type. Below this last ridge, on a small stream flowing into Black Bear Creek, we halted our outfit for the last time. It was impossible to take our horses further. We made a permanent base camp and turned our horses out in a 250-acre meadow to graze.

On August 19th, our difficult work had just begun. Rugged, wild country lay between us and the Big Mountain, that we knew; how vast and how difficult we could only imagine. Our last hope of reaching it was to "back-pack." Accordingly, we took four days of "grub," our personal and climbing outfits on our backs and plunged into the unknown. Miss Springate and I each carried an eider-down quilt, our personal belongings, and our cameras—fifteen pound packs—while the men carried 30 to 40 pounds. We took a small silk shelter tent, but the men had only a thin canvas bed cover between them, in lieu of a blanket. One frying pan, two small pails, four cups, and four spoons were the sum total of our kitchen outfit. I allowed myself the luxury of one cake of soap and a tooth brush; two oranges and six lemons I carried for the climb, but a towel and a change of clothing were forbidden. We cached our main outfit under the big tent fly and left behind us on a blazed tree a statement of our route and destination.

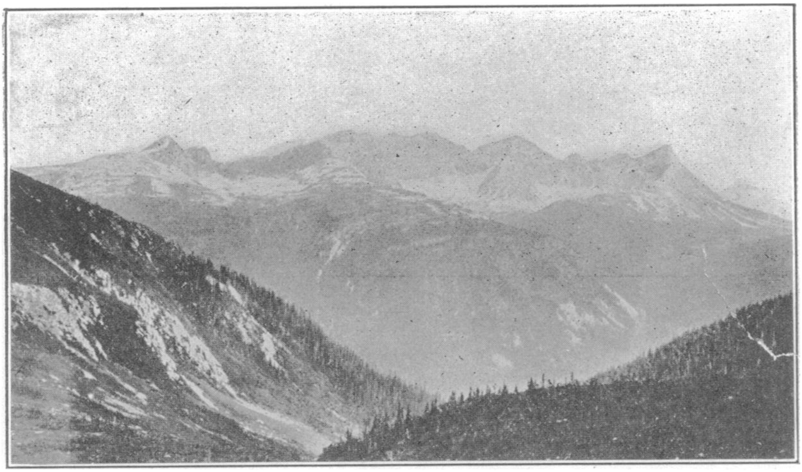

Fig. 5—Range between Black Bear Creek and Big Salmon River, taken from Last Horse Camp, looking northwest. Providence Pass is the saddle in the background at the extreme right.

We hoped to reach the base of the mountain that night. However, we did not reckon on traveling through even thicker scrub and underbrush. We now struck dense alder thickets, and devil's club in full leaf and higher than our heads. To avoid these we traveled in the beds of small streams, but after a while the supply of streams gave out. We forded Black Bear Creek, in two and one-half feet of water, and then struck hard climbing on the mountain beyond, thick scrub interspersed with stiff cliffs. Our packs were heavy, there was no sign of water, the heat was intense, and our progress was slow. Near the top we found a tiny trickling stream, from which we collected a few spoonfuls of water in our rubber drinking cups. We had had no water during six hours of hard climbing. Ascending a rocky ridge we came out above tree line into a rock-filled amphitheater, from which the Big Mountain, with its numerous glaciers and adjacent rock towers, was distinctly seen, but still another ridge and valley separated us therefrom. Crossing about two miles of rock-fall we scrambled over a long treeless ridge and beheld without interruption the great bulk of Mt. Kitchi. A giant ice peak rose from a massive base of rock. As we looked at the mountain from the south-east, two conical rock towers, whose multi-colored rocks glistened in the evening light, were in the north-eastern foreground, while just beyond them we caught a glimpse of a long flowing glacier. Fifteen hundred feet below us, a torrential glacial river wound tortuously off to the south-west. It was the South Fork of the Big Salmon, and is formed by three converging branches which have their headwaters in the large glaciers on the north-east side of Mt. Kitchi. That night we made camp at tree line, as our progress in the direct line toward the mountain was now hindered by steep cliffs. Making a detour to the west, the next day, we followed an opening in these cliffs down an almost perpen-

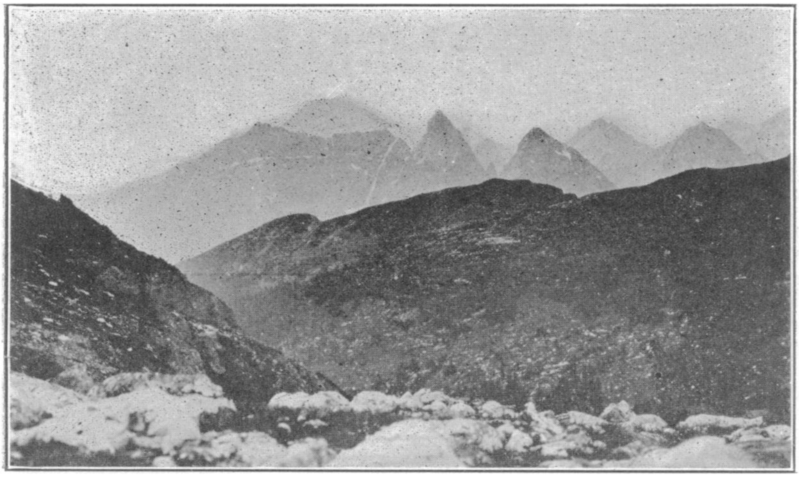

Fig. 6—View of Mt. Kitchi looking north-northwest from the northern slope of the range shown in Fig. 5. The main peak appears above the amphitheater which is flanked by the Two Towers on the right.

dicular slope, well-forested with rhododendrons and devil's club, to the valley of the Big Salmon. This additional day consumed in reaching the base of the mountain put us on rations. One large "flapjack" was our luncheon allowance. It was amazing how that flapjack cheered us and stayed "by us" during the six and one-half hours of our afternoon's march. Traveling up the valley, we crossed two of the large northeast tributaries of the Big Salmon, the one on a log jam, the other on a tree Phillips felled.

We intended to camp on the terminal moraine of the east glacier. It runs right in to the timber, and obtaining fuel would have been easy. An approaching thunderstorm made camp necessary when we were about a mile below the moraine. We barely got the little silk shelter tent up and our packs inside when the storm broke. All night the rain and snow fell. The next day was an impossible one for climbing. The rain stopped at three and Phillips went out to reconnoiter. He felled a tree across the river (the main branch of the South Fork of the Big Salmon), which was still too powerful to ford even at this proximity to its source, and crossed the east glacier to look out a route, for our proposed climb on Mt. Kitchi on the morrow. The south and east faces of the mountain rise over 2,000 feet perpendicularly from hanging glaciers. These hanging glaciers on the main peak itself and on the north side of the Two Towers constantly avalanche on the long flowing east glacier. This east glacier is about two and a half miles from east to west, and two miles from north to south. It is everywhere deeply crevassed. The aneroid registered only 4,000 feet at the base of the terminal moraine, thus showing the ice to descend 1,500 feet lower than at Mt. Robson. At a distance this long flowing east glacier had seemed the feasible line of attack, for there the cliffs had not been visible. Obviously, another route must be selected. We hoped that the north and west slopes might be climbable. This hope was not founded on our observation of the mountains in this region, for the north side is always the difficult one. Phillips returned at ten o'clock, stating that he was able to locate a route only to the base of the last peak. What lay beyond, he could only conjecture.

The next morning, August 22nd, dawned cloudy. We started at 6 A. M. and after crossing two miles of deeply crevassed glacier came out on a long moraine. From this we climbed on the north-east side over rock-falls and cliffs to the northeast glacier. Shortly before reaching the second glacier it began to snow. We put on our extra sweaters, mittens, and caps. For two hours we traveled very carefully over the glacier, hoping that the storm would cease. Instead it snowed the harder. Climbing became dangerous and we turned back at 7,000 feet, having climbed 2,900 feet from our camp. We were encased in ice at this elevation, and by the time we reached camp we were drenched to the skin. As "back packing" does not admit of the luxury of a change of raiment, we dried out by the fire. It cleared at 11 P. M.

We were now on very short rations, but near camp had killed six ptarmigan and that made possible the thought of climbing again on the morrow. However, at 6 A. M. a light rain was falling, and it was snowing hard on the mountain. Our immediate return to our base camp was imperative. Although there were signs of all kinds of big game around us, they had effectually vanished at our approach. Our homeward trip through rain-soaked underbrush was melancholy. My one hope was to kill some game and return for another attempt on the mountain. At noon we had eaten everything but a little flour, tea, and four slices of bacon. We went home a different route, crossing the east branch of the South Fork of the Big Salmon three or four miles above the log jam. About 5 P. M., after climbing 1,500 feet up the worst rhododendron mountain yet encountered, we were fortunate enough to kill a caribou, which supply made possible another attempt on the mountain.

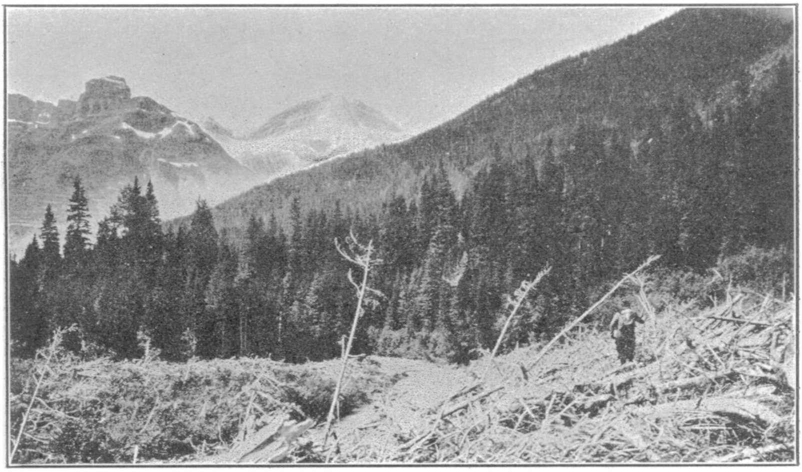

FIG. 7—Providence Creek, showing Mt. Kitchi in the distance. Looking west.

However, as Wilkins had developed rheumatism in his shoulder it was decided that he should continue to the main camp. Miss Springate had not attempted to climb on the previous trip, and now, although keen for the experience of a second expedition to the base of the mountain, she graciously abandoned any idea of going back when she was aware that it would be impossible for Phillips to pack supplies for three. It was her unselfish spirit displayed at the critical moment which made possible the exploration of Mt. Kitchi.

Phillips and I accordingly returned to our old camp, having cut down our packs to the last ounce. We took with us the four slices of bacon, and part of the tea and flour, but our main food supply was the freshly killed caribou. *We had no salt.* Instead of carrying the silk shelter tent, we strung up the piece of canvas as a windbreak and slept by a fire.

At daybreak on August 25th we began our climb, following our old route across the east glacier, over the moraine and thence across the cliffs to the second glacier. Going beyond the point at which the storm had driven us back, we found the second glacier of vast extent, very steep and deeply serrated with crevasses, some of them being twenty feet in width and easily fifty feet in depth. This second glacier is flanked on the north by a constantly avalanching hanging glacier, while it in turn breaks off above the east glacier. Before making this second attempt I had questioned the advisability of climbing with only two on the rope. Phillips had replied, "We'll keep fifty feet of rope between us and if I get into a crevasse not more than four feet wide, I can cut steps and climb out." Few of the crevasses were more than fifty feet deep. Consequently, in case of a fall into a crevasse, the fifty feet of rope would admit of my untying my end of the rope, of anchoring my ice axe, and of tying the rope securely to the ice axe so that Phillips could cut steps and climb out of the crevasse. We did keep fifty feet of rope between us, and so traveled up that wonderful glacier. On either side of us were great ice walls, 500 to 1,000 feet high, blue and crevassed from foot to top. This northeast glacier, where it breaks off above the east glacier, assumes at its terminus most curiously fantastic shapes. Many of these seemed like colossal animals sitting in a row. We named it the Menagerie Glacier. We crossed the northeast glacier, reaching an elevation of 7,800 feet. At this point we had our first view of the northwest face of the mountain. Instead of the long snow slope we had anticipated, the peak shoots up into the sky, a sharp pinnacle of ice and rock like an elongated church steeple. Two bands of rock cliffs with numerous chimneys extend across the northwest face; between these is a constantly avalanching ice and snow slope. Above the second band of cliffs is a mass of ice, broken by crevasses and seracs. Through the glasses it showed blue-green with long icicles depending across the caverns. The arête leading from our point of observation is everywhere knife-like and broken.

We could easily have climbed 800 feet further, but as that would have been futile we built a cairn at 7,500 feet, and returned to our camp after having spent fourteen hours on the mountain.

The last peak rises probably 2,500 feet above the base of the first cliffs. From its northwest face a long, flowing glacier extends for about two miles. Above it on the long west ridge adjoining the mountain are numerous hanging glaciers. This watershed leads to a deep valley with a broad river flowing through to the southwest. Through the glasses it looked easily 500 feet wide, and is without doubt the main branch of the Big Salmon. Below the southeast slopes are the two glaciers already mentioned (the ones we crossed on our climb), while the long ridge to the south holds small hanging glaciers. One peculiarly characteristic feature of the mountain is the two big rock towers on the east side. They are of slightly different height, and are separated by a sharp rock pinnacle (mitre shaped). To the north of Mt. Kitchi, and probably ten miles away, is a sharp snow peak, possibly a 10,000 foot mountain. It is the peak marked "Mt. Ida" on the Grand Trunk Pacific map. We saw this peak from "Mt. Pamm," and several times thereafter on our trip. Across a pass to the northeast of Mt. Kitchi are two lovely clear-water lakes, each apparently a mile in length.

Heretofore, practically everyone who has seen Mt. Kitchi has estimated it at 12,000 or 12,500 feet. We have estimated its elevation at not more than 11,000 feet. When we stood at the base of the last peak, our aneroid registered only 8,000 feet. It is doubtful whether the main peak is more than 3,000 feet above this point of its surrounding ice and rock abutments. The mountains in its immediate environment are low; the snow line is 4,000 feet, consequently these two facts alone lead one to an exaggerated estimate of the height of the mountain, especially if the observations are made at a distance.

Mt. Kitchi is not only supreme in its immediate environment, but it has points that make it notable among mountains in general. Frequently, high mountains are surrounded by other mountains only slightly less in elevation; but Kitchi rises impressively above all nearby peaks. It is between 2,000 and 3,000 feet higher than the neighboring peaks, while its only rival, ''Mt. Ida,'' nearly six miles distant, seems more than 1,000 feet lower. Standing out boldly near the northwestern edge of the Rockies, this ''last sentinel'' of the North faces on the one side the deep valleys of the two branches of the Big Salmon, and on the other the low mountains merging into the blue foothills of the Peace. The lower half of the mountain rising from the Big Salmon as seen from the southeast is built of well-defined strata of reddish brown rock, in many places nearly horizontal; in others, deeply twisted and acutely slanted. The upper half is a sheer snow peak, broken occasionally by bands of rock over which the snow and ice constantly avalanche. No side of the mountain is free from these avalanches. The Two Towers, rising as abutments on the southeast and separated from the main peak by glaciers, are sheer, beautiful, and unique. The little mitre between the two towers is not unlike the ''Mitre'' in the southern Canadian Rockies, near Mt. Lefroy. In the Big Salmon valley, the Two Towers cut off the view of the summit, but two miles from the source of the river, one sees the main peak rising above the long flowing glacier to the north of the Two Towers, as an irregular pyramid. From the east and the northeast glaciers, the mountain assumes the form of a ridge, the knife-like edge of which is the sky line. The glacial area surrounding the mountain we estimated at 35 square miles, while its location is approximately 120°10 W. and 54° N.

In conclusion: I wish to say that the main factors in our success in exploring the new country between the headwaters of the Jack Pine and Mt. Kitchi, and in exploring Mt. Kitchi itself, were the splendid ability, unflinching courage, and determined effort of Donald Phillips.

NOTE ON THE MAP

To accompany her article Miss Jobe had originally prepared a sketch map, based on her and Donald Phillips's observations, which, while showing remarkably well the essential features of the country, did not partake of the nature of an instrumental survey. Subsequently an unpublished blue-print map of the Grand Trunk Pacific Railway (1a in appended list of maps) came to her knowledge, which showed in contours the topography of the whole mountain region between Jarvis Pass and the transverse courses of the Jack Pine and Smoky Rivers and its relation to the Fraser valley. Recognizing that this was a much more satisfactory representation, being based on an instrumental survey, it was decided to use it, together with all other available sources, in the compilation of a new map. As the blue-print map contained no geographic coordinates, it was necessary to supply them. This was done by drawing the parallel of 53° and the meridian of 119° in their proper positions as deduced from the known astronomic position of the township and range lines shown on the Yellowhead sheet of the Sectional Map of Western Canada (7) and from them expanding the coordinate net over the rest of the map. The resulting position of Jarvis Pass was 53°59′, and of the head of the larger lake at the head of the right source-stream of the Porcupine, 53°51′. The corresponding positions on the two most reliable maps each showing one of these features (Dawson, 10, and Northern Alberta, 11), are 54°9′[1] and 54°2′. In addition to this divergence the blue-print map showed the Sulphur River heading in the same divide as the East Branch of the Moose River, in contradiction of both Wheeler's map (4) and the map of Northern Alberta, and placed Mt. Kitchi about 30 miles from the Fraser valley, while Donald Phillips stated that it was not less than 40 miles. These and other discrepancies led the writer to believe that the contoured mountain area on the blue-print map was shown in incorrect relation to the Fraser valley, and it was accordingly pushed north to the latitude shown on the map of Northern Alberta. Subsequent correspondence with the Grand Trunk Pacific Railway brought to light another blue-print map of the same region which developed to be the original (1). On this the mountain area was shown in its northern location, with Jarvis Pass in 54°9′. The evidence now seemed conclusive that this was the correct interpretation and it was so accepted in the compilation of the map.

With the northern section of the map thus accounted for, the compilation of the remainder was relatively easy. In the southeast Wheeler's excellent photographic survey of the Mt. Robson region (4) was used and its contours interpreted by hachuring in the style of the Sectional Map of Western Canada (7), while retaining from Wheeler's map the representation of the glaciers, which are left blank on the Sectional Map. To the southwest the topography was expanded from McEvoy's contoured map (5). The Fraser River itself was taken from the Pre-emptor's map (6), while the walls of its trough valley were generalized from the contours in the original edition of the Grand Trunk map (1). The region adjoining the Wheeler survey to the north was filled in from Dr. Collie's map (3). (This map also includes the Mt. Robson region, but here it is, of course, superseded by Wheeler's map.) This left a wedge-shaped gap, 5 to 15 miles wide, between Collie's survey and the Grand Trunk Pacific survey. For this section Donald Phillips's sketch map (2) was alone available.

Not only here, but throughout the map his data have been used in correction or amplification of the other sources. For instance, on the northwestern edge of Wheeler's map Wolverene Creek is connected with the head of the Beaver; instead there should be a divide between them, as shown on the present map and also on Collie's. At Meadow Lake Pass the Grand Trunk Pacific map shows the divide to lie south of the largest lake; Phillips states it to lie north of it. On the Grand Trunk map neither the bend of the Big Salmon around the southern base of Mt. Kitchi is shown nor Providence Creek. The headwaters of the latter are there conjectured to flow into Black Bear Creek over what is actually Providence Pass: the drainage in this region has therefore been altered according to information furnished by Miss Jobe and Donald Phillips.

From what has been said it will be evident that the various sections of the map are of very unequal value. Wheeler's survey and the Fraser River are the most correct; next in accuracy come the Grand Trunk Pacific survey and McEvoy's survey, which are of reconnaissance grade; then comes Collie's survey and, finally, the section based on Phillips alone.

While all the other sections of the map are geometrical reductions of the originals, in the case of Collie's survey distortion was necessary in order to make it fit. Using the head of the Smoky River and the confluence of the Jack Pine with it as two points whose location was known (one from Wheeler's map, the other from the Grand Trunk map), the Smoky River was fitted in between these two points. This gives it a more meridional trend than in Collie's map, where its direction is north-northwest. It also gives it a change in trend at the mouth of the Wolverene which is not present on Collie's map, where the whole river from Calumet Creek to the edge of the map is rectilinear. Which version is correct remains to be seen. The prevailing northwest-southeast trend of the structural valleys in this part of the Rocky Mountains would seem to argue for the greater correctness of Collie's map. On the other hand, the trend is incorrect on his map of several valleys in the Mt. Robson region, as indicated by Wheeler's later and more correct survey; and furthermore a difference is apparent from the map in the structure of the mountains north of the transverse courses of the Jack Pine and Smoky, where transverse and not longitudinal valleys predominate. The influence of this structural change might extend south to the upper Smoky valley. The upper valley of the Jack Pine and, consequently, the whole region between it and the Smoky have also been swung into a more meridional position. The trend of the upper Beaver having been retained, on the basis of Phillips's sketch map, as on Collie's map, this has resulted in a widening of the ridge between the upper Beaver and Jack Pine.

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[1] While stating the latitude of Jarvis Pass to be 54°7′, the map represents it in 54°9′.

In the east the adjustment of Collie's survey was very satisfactory. By making the bend of the Middle Branch of the Stony River (53°15′ N. and 118°50′ W.) coincide with the same feature on the Wheeler map and drawing the remainder of the Stony drainage in its geometrical proportions, the North Branch of the Stony, taken from the Grand Trunk map, when continued to the southeast, coincided with the Deer Creek of Collie's map. The interpretation of Deer Creek as the lower North Branch seemed to be confirmed by the Grand Trunk map, on which the main Stony is shown as surveyed from its mouth to the junction of the Middle Branch, with only a small piece left conjectural between it and the North Branch. If this interpretation be correct, then Collie's North Branch (the next valley to the west, left unnamed on the present map) would simply be another longitudinal valley, presumably also leading over to the Sulphur River.

A different identification from Collie is here also given in the case of the South Branch of the Stony. By this name Collie designates the short transverse valley, here left unnamed, which forms the upper continuation of the lower Middle Branch. On Wheeler's map the head of the South Branch is shown as here reproduced. As this seems to be a major tributary, Wheeler's designation has been retained and its conjectural course shown as on the map of Northern Alberta, on which Wheeler's designation is also followed.

It has been thought wise to enter into the details of the construction of the map, inasmuch as a compilation of this nature, as contrasted with an original survey, is based on critique and not on observation, and a judgment as to its correctness can only be formed when the methods employed are known. In spite of its obvious lack of finality, the map, it is believed, constitutes a more complete representation of the region according to our present state of knowledge than heretofore available. Comparison with the latest editions of the largest-scale general maps including this region—the map of Northern Alberta (11) and the map of British Columbia (12)—will bear this out. Aside from the fact that these maps do not show relief, they have not always utilized all the sources. While reproducing Wheeler's survey the map of Northern Alberta (corrected to Sept. 1, 1914) does not utilize Collie's survey, although it was published in March, 1912. Both maps in the representation of the headwaters of the Smoky are evidently based on the Grand Trunk map—which has doubtless been filed with the Dominion railway commissioners. While the British Columbia map reproduces it *in toto,* the Northern Alberta map has modified the region near the confluence of Sheep Creek with the Smoky and the course of the Muskeg River, presumably on the basis of the surveys of the Fifteenth and the Sixteenth Base Lines (8 and 9). While the survey of the base lines themselves is probably satisfactory, the topography on each side does not claim to be,[2] and it would seem wiser to retain the railroad survey, which is at least consistent within itself. With regard to the upper courses of the Smoky, Jack Pine and main Beaver these two maps are either conjectural or are left blank. But their course determines the continental divide and, consequently, the boundary between Alberta and British Columbia, which follows the divide from the United States boundary to the 120th meridian. The present map is therefore able to offer some additional information on this question of practical interest.

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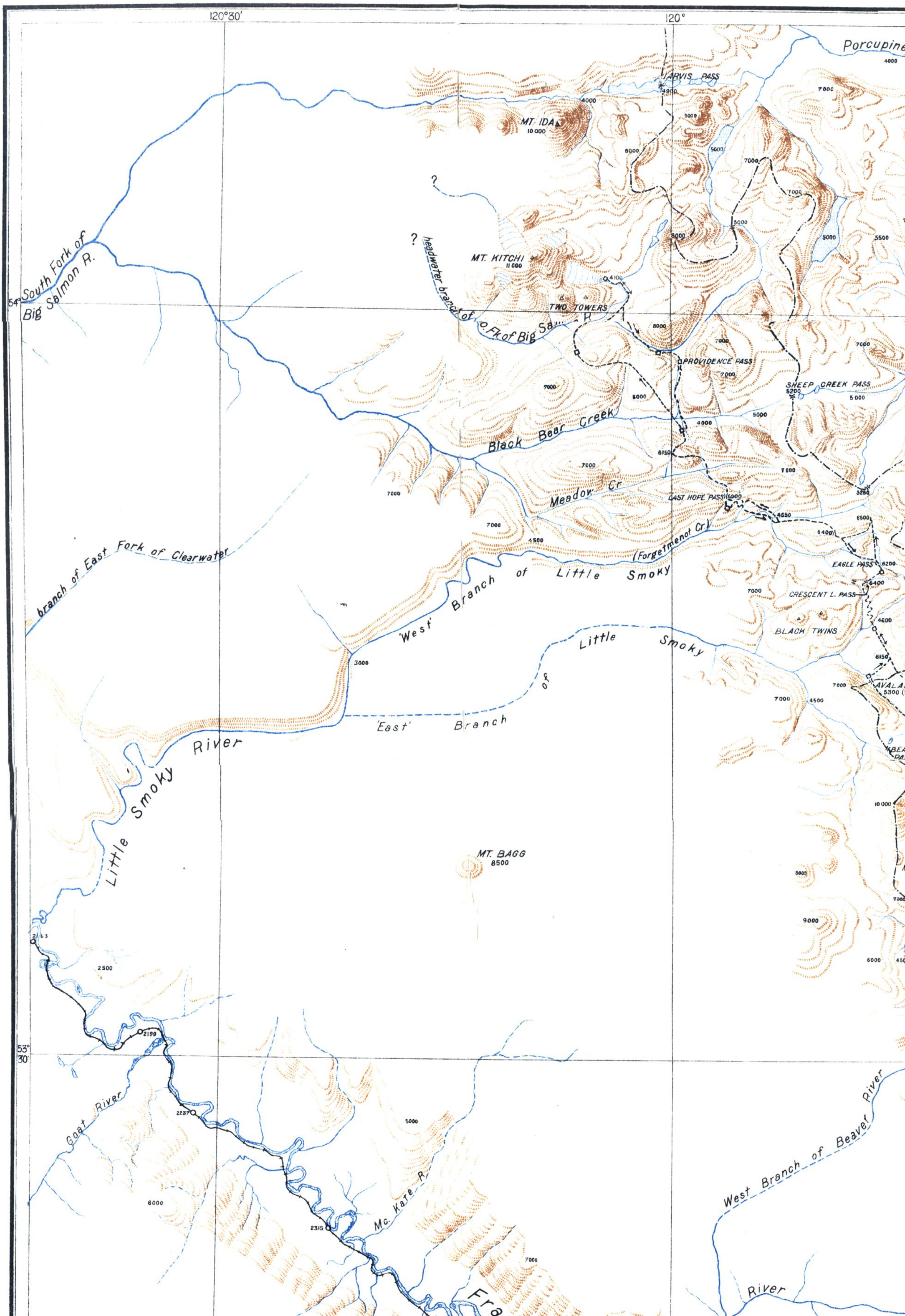
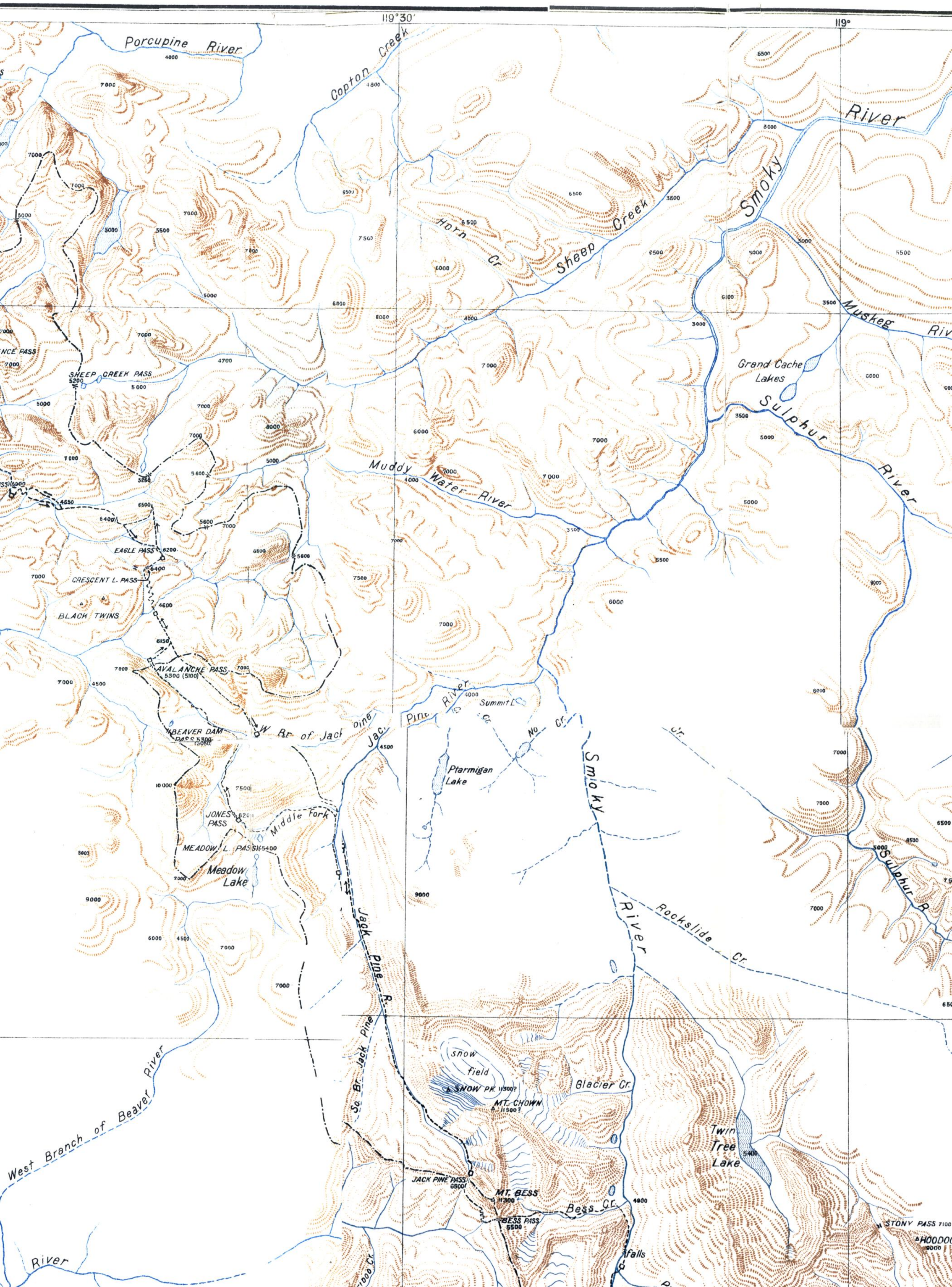
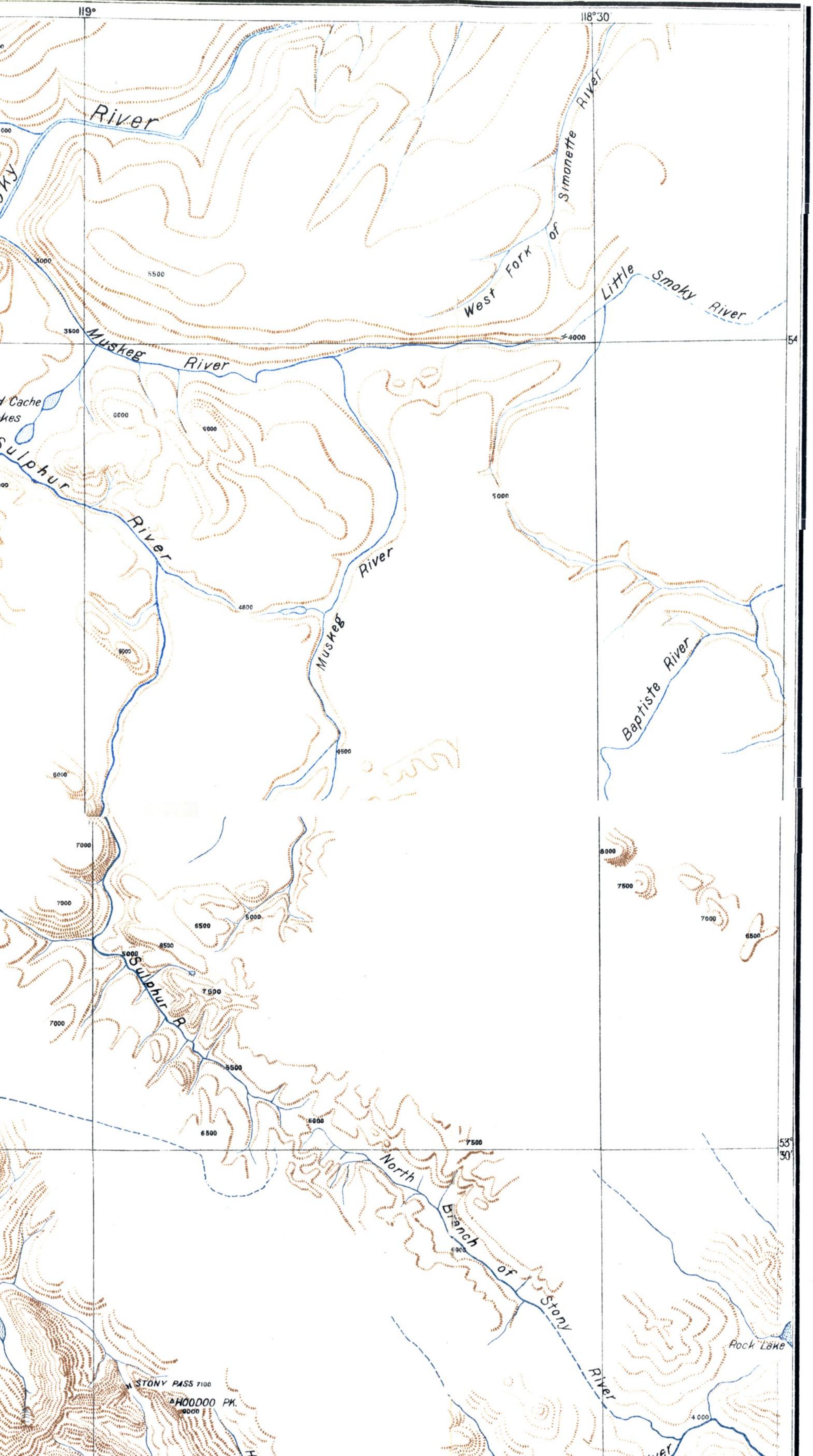
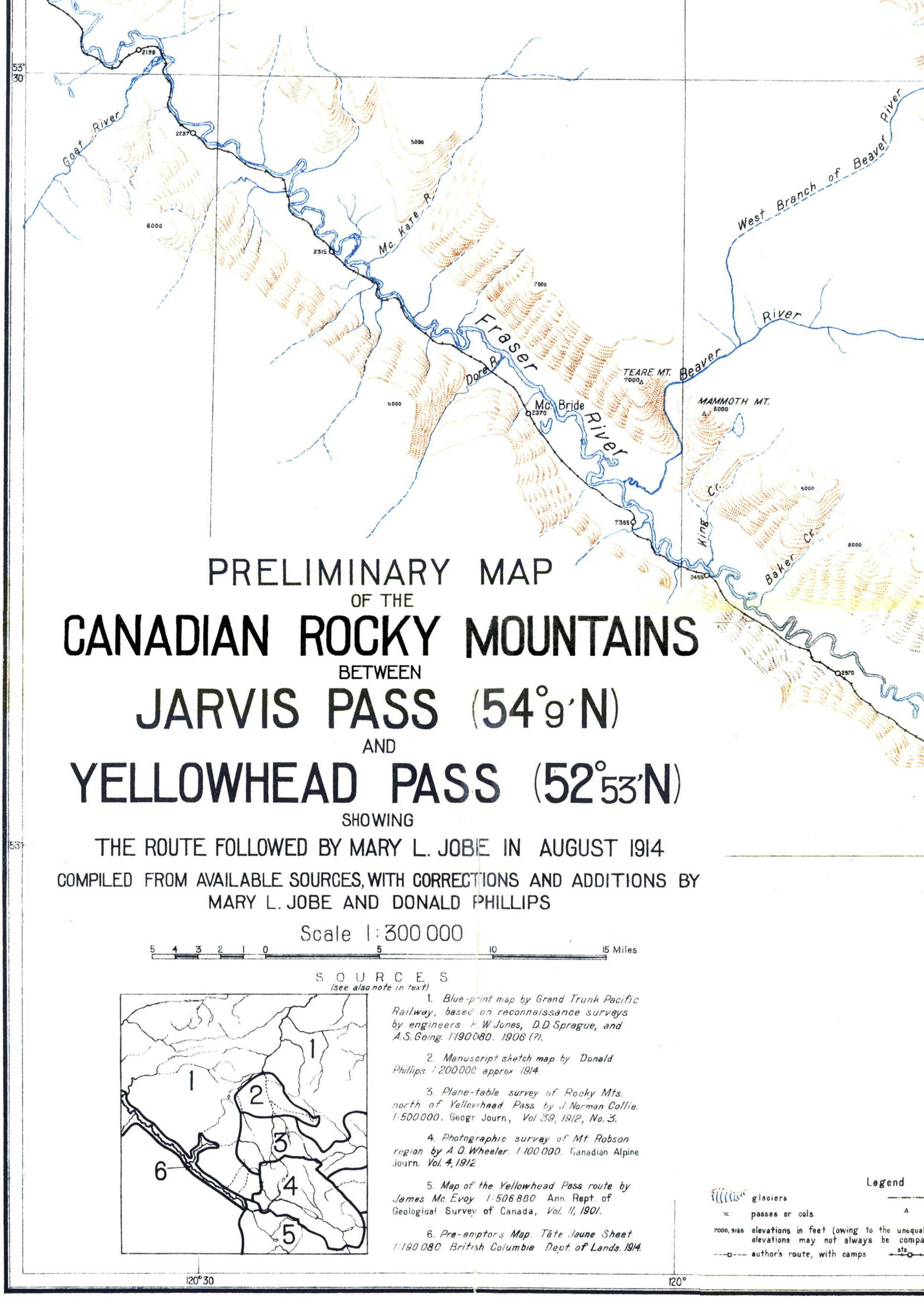
[2] On map 8 the Smoky crosses the line between townships 58 and 59 in range 7, on map 9 it crosses the same line in the corresponding part of range 6. This has led to its being stretched on the map of Northern Alberta.



120°30'
120°
54°
53° 30'
Porcupine
JARVIS PASS
4900
4000
MT. IDA
10 000
8000
5000
7000
MT. KITCHI
11 000
TWO TOWERS
4100
?
headwater branch of S. Fk of Big Salmon R.
South Fork of Big Salmon R.
PROVIDENCE PASS
SHEEP CREEK PASS
5200
Black Bear Creek
6150
Meadow Cr
LAST HOPE PASS
6500
4650
5250
6400
EAGLE PASS
6200
CRESCENT L. PASS
BLACK TWINS
4600
AVALA
5300
(Forgetmenot Cr)
'West' Branch of Little Smoky
branch of East Fork of Clearwater
3000
4500
'East' Branch of Little Smoky
Little Smoky River
MT. BAGG
8500
2500
2199
2237
2315
Goat River
Mc Kale R.
6000
Fra
West Branch of Beaver River
River
9000


119°30'
119°
Porcupine River
Copton Creek
Smoky River
Sheep Creek
Horn Cr.
Muskeg River
Grand Cache Lakes
Sulphur River
Muddy Water River
SHEEP CREEK PASS 5200
EAGLE PASS 6200
CRESCENT L. PASS
BLACK TWINS
AVALANCHE PASS 5300 (5100)
BEAVER DAM PASS 5300
W. Br. of Jack Pine
Jack Pine River
Summit L.
No Cr.
Ptarmigan Lake
Smoky
JONES PASS 6200
Middle Fork
MEADOW L. PASS 5400
Meadow Lake
Jack Pine R.
River
Rockslide Cr.
Sulphur R.
So. Br. Jack Pine
snow field
SNOW PK. 11300?
MT. CHOWN 11500?
Glacier Cr.
Twin Tree Lake
JACK PINE PASS 6500
MT. BESS 11300
BESS PASS 5500
Bess Cr.
falls
STONY PASS 7100
HOODOO 9000
West Branch of Beaver River
River


119°
118°30'
River
oky
3000
5500
3500
Muskeg River
West Fork of Simonette River
Little Smoky River
+4000
54
d Cache
kes
6000
5000
Sulphur River
5000
Muskeg River
4800
Baptiste River
6000
4500
6000
7000
7000
6500
5000
6500
5000
Sulphur R.
7500
7000
5500
6500
6000
7500
8000
7500
7000
6500
53°
30'
North Branch of Stony River
Rock Lake
STONY PASS 7100
HOODOO PK.
9000
River
4000



PRELIMINARY MAP
OF THE
CANADIAN ROCKY MOUNTAINS
BETWEEN
JARVIS PASS (54°9'N)
AND
YELLOWHEAD PASS (52°53'N)
SHOWING
THE ROUTE FOLLOWED BY MARY L. JOBE IN AUGUST 1914

COMPILED FROM AVAILABLE SOURCES, WITH CORRECTIONS AND ADDITIONS BY
MARY L. JOBE AND DONALD PHILLIPS

Scale 1:300 000

5 4 3 2 1 0 5 10 15 Miles

SOURCES
(see also note in text)

1. *Blue-print map by Grand Trunk Pacific Railway, based on reconnaissance surveys by engineers H. W. Jones, D.D. Sprague, and A.S. Going. 1:190080. 1906 (?).*

2. *Manuscript sketch map by Donald Phillips 1:200000 approx 1914.*

3. *Plane-table survey of Rocky Mts. north of Yellowhead Pass by J. Norman Collie. 1:500000.* Geogr Journ., *Vol 39, 1912, No. 3.*

4. *Photographic survey of Mt Robson region by A. O. Wheeler. 1:100000.* Canadian Alpine Journ. *Vol. 4, 1912*

5. *Map of the Yellowhead Pass route by James Mc Evoy 1:506880* Ann. Rept. of Geological Survey of Canada, *Vol. 11, 1901.*

6. *Pre-emptors Map. Tête Jaune Sheet 1:190080. British Columbia Dept. of Lands. 1914.*

Legend

⁞⁞⁞	glaciers
≍	passes or cols
7000, 9166	elevations in feet (owing to the unequal elevations may not always be compa
---□---	author's route, with camps

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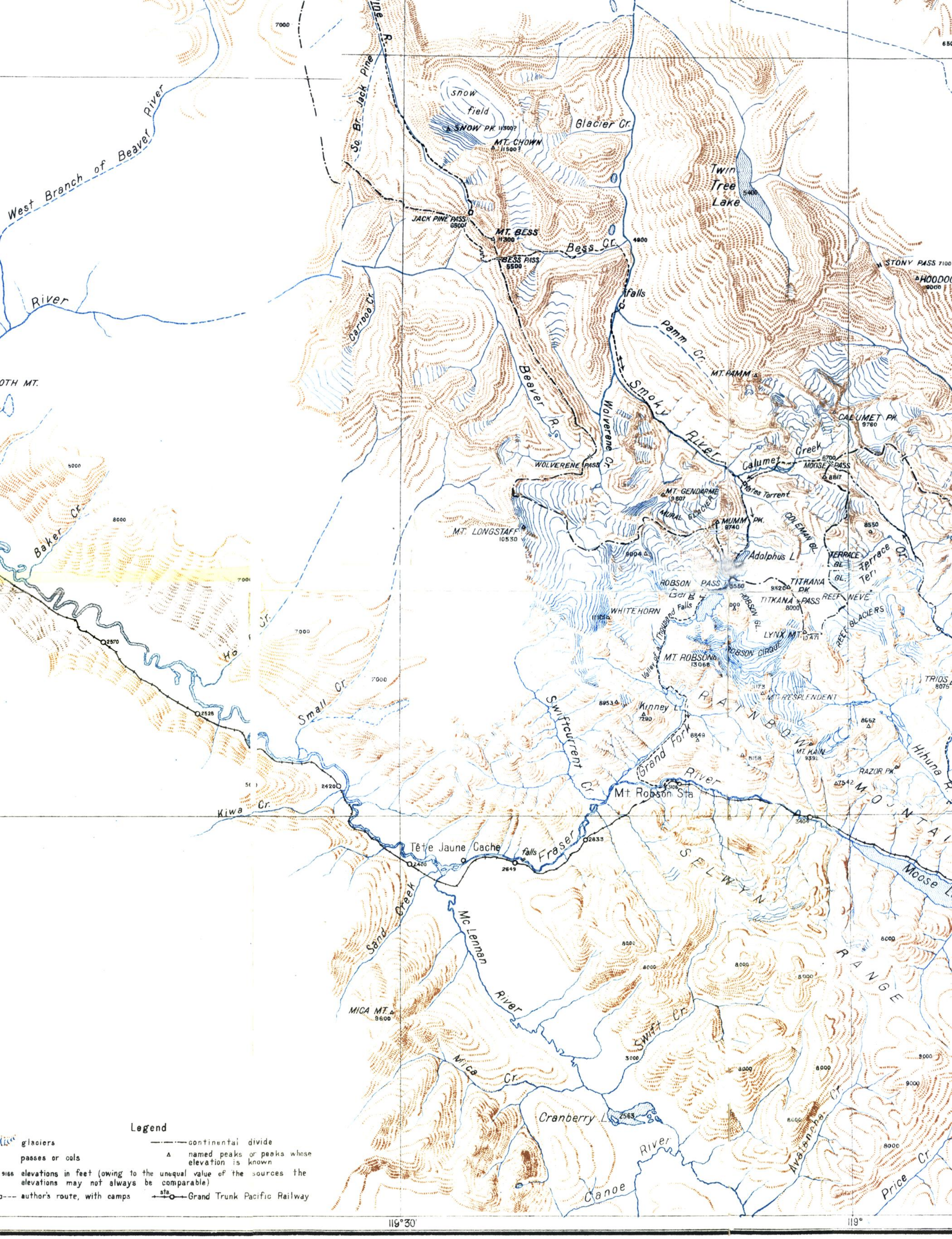
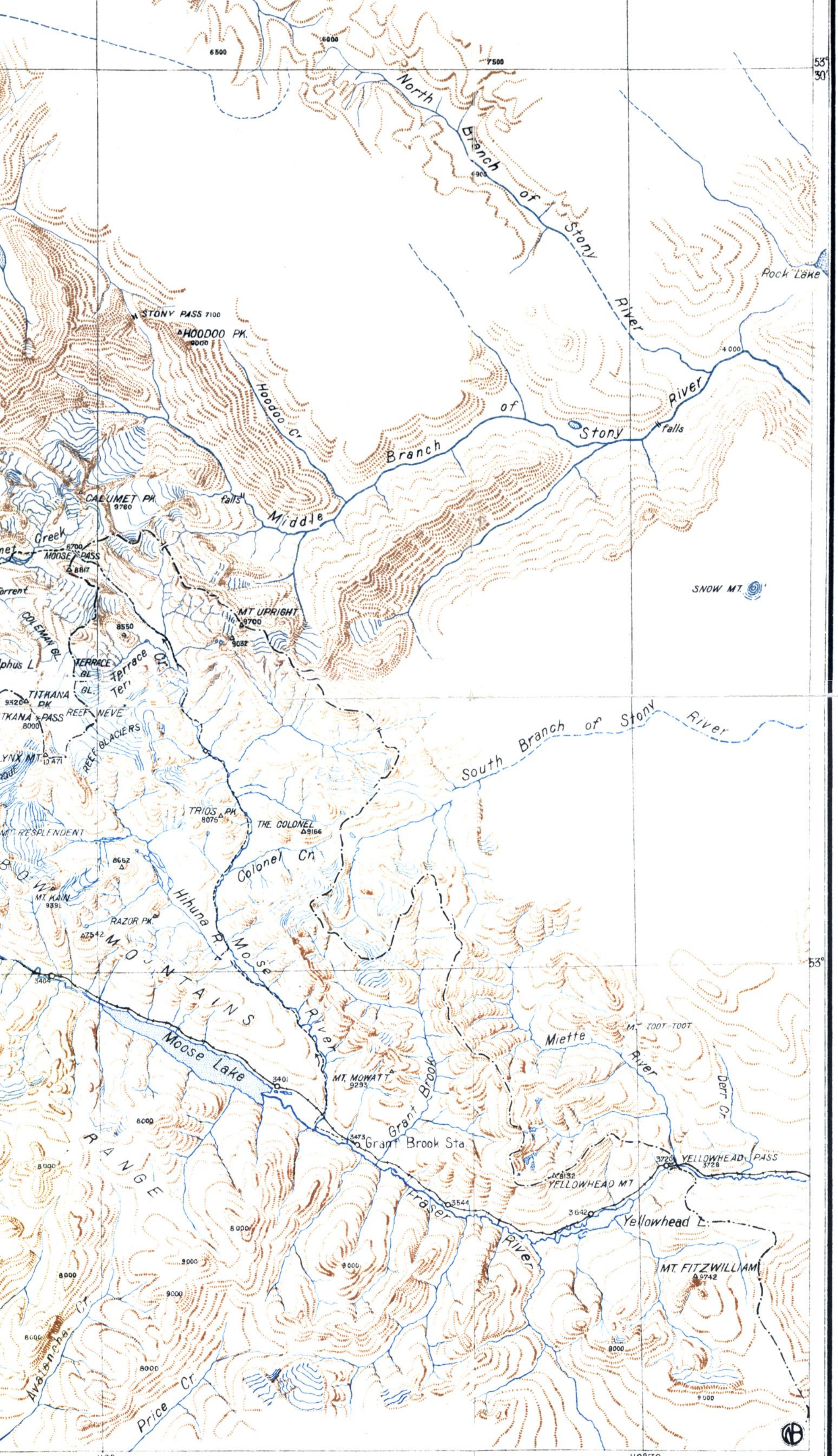
sta.


West Branch of Beaver River
River
7000
So. Br. Jack Pine
R.
snow
field
SNOW PK. 11300?
MT. CHOWN
11500?
Glacier Cr.
Twin
Tree
Lake
5400
JACK PINE PASS
6500?
MT. BESS
11300
BESS PASS
5500
Bess Cr.
4900
STONY PASS 7100
HOODOO
9000
falls
Cariboo Cr.
Pamm Cr.
MT. PAMM
Beaver R.
Smoky River
Wolverene Cr.
CALUMET PK.
9760
Calumet Creek
6700
MOOSE PASS
8817
WOLVERENE PASS
Yates Torrent
MT. GENDARME
9607
MURAL GLACIER
MUMM PK.
9740
COLEMAN GL.
8550
MT. LONGSTAFF
10530
9004
Adolphus L.
TERRACE GL.
GL.
Terrace Cr.
Terr
ROBSON PASS
5550
Berg L.
9320
TITKANA PK.
TITKANA PASS
8000
REEF NEVE
ROBSON GL.
REEF GLACIERS
WHITEHORN
11101
Valley of a Thousand Falls
LYNX MT.
10471
MT. ROBSON
13068
ROBSON CIRQUE
TRIOS
8075
11173
MT. RESPLENDENT
RAINBOW MOUNTAINS
8953
Kinney L.
7290
6849
8662
MT. KAIN
9398
8158
RAZOR PK.
7542
Hihuna R.
Grand Fork
River
Mt. Robson Sta.
3400
OTH MT.
8000
8000
Baker Cr.
7000
Ho Cr.
7000
2570
2528
Small Cr.
7000
Swiftcurrent Cr.
2420
Kiwa Cr.
Têtе Jaune Cache
2400
2649
falls
Fraser
2833
SELWYN RANGE
Moose L.
Sand Creek
Mc Lennan River
8000
8000
8000
8000
8000
MICA MT.
9600
Swift Cr.
3000
Mica Cr.
8000
8000
9000
9000
Cranberry L.
2563
River
Canoe
Avalanche Cr.
8000
Price Cr.
119°30'
119°
Legend
glaciers
passes or cols
9166 elevations in feet (owing to the unequal value of the sources the elevations may not always be comparable)
author's route, with camps
continental divide
named peaks or peaks whose elevation is known
sta.
Grand Trunk Pacific Railway



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In conclusion it is a pleasure to acknowledge the Society's indebtedness to the Grand Trunk Pacific Railway for the permission to reproduce its blue-print map and particularly to its Assistant Chief Engineer, Mr. A. A. Woods, for his unfailing courtesy in answering inquiries. Dr. E. Deville, the Surveyor General of Canada, was also good enough to answer several inquiries as to the reliability of various government maps. During compilation, Miss Jobe and Mr. Phillips kindly checked up the map from notes and photographs and offered helpful suggestions.

Any information tending to the correction or expansion of the map will be gratefully received by the Society. W. L. G. J.

List of Maps Used.

1. [Blue-print map by Grand Trunk Pacific Railway]. 1:190,080. In two latitudinal strips covering 56°12′ - 52°45′ N. and 123°15′ - 117° W. 1906?.
[Original. Correct location of mountain region. Shows geographic coordinates and township squares. Relief in contours. Routes of engineers' reconnaissance surveys shown (R. W. Jones, D. D. Sprague, A. S. Going), affording criterion as to reliability of various sections. Fraser valley in reconnaissance.]

1a. [Blue-print map by Grand Trunk Pacific Railway]. 1:190,080. Section covering 54°20′ - 52°45′ N. and 123°15′ - 118°30′ W. 1914?.
[Copy from above. Incorrect location of mountain region. No geographic coordinates or township squares. Fraser valley from land surveys.]

2. [Manuscript sketch map by Mary L. Jobe and Donald Phillips]. 1:200,000 approx. 54°10′ - 52°45′ N.; 122°0′ - 118°25′ W. 1915.

3. Part of the Rocky Mountains north of the Yellowhead Pass, from a plane table survey by Professor J. Norman Collie, F.R.S., 1910-11. 1:500,000. 53°35′ - 52°35′ N.; 120°0′ - 117°30′ W. Accompanies "Exploration in the Rocky Mountains North of the Yellowhead Pass" by J. Norman Collie, *Geogr. Journ.*, Vol. 39, 1912, No. 3, pp. 223-235.
[Relief in shading.]

4. Topographical Map Showing Mount Robson and Mountains of the Continental Divide North Yellowhead Pass. From photographic surveys by Arthur O. Wheeler. [1:100,000]. [53°17′ - 52°45′ N.; 119°27′ - 118°20′ W.] Accompanies "The Alpine Club of Canada's Expedition to Jasper Park, Yellowhead Pass and Mount Robson Region, 1911," by A. O. Wheeler, *Canadian Alpine Journ.*, Vol. 4, 1912, pp. 1-83; also "Special Number" of *Canadian Alpine Journ.*, 1912; also "The Mountains of the Yellowhead Pass" by A. O. Wheeler, *Alpine Journ.*, Vol. 26, 1912, pp. 382-407; also *Annual Report Topogr. Surv. Branch for 1911-12*, Ottawa, 1913.
[Relief in contours.]

5. Map showing Yellowhead Pass Route from Edmonton to Tête-Jaune Cache. 1:506,880. 53°45′ - 52°38′ N.; 119°34′ - 113°18′ W. Accompanies "Report on the Geology and Natural Resources of the Country Traversed by the Yellowhead Pass Route from Edmonton to Tête Jaune Cache" by James McEvoy, Sub-report D (44 pp., 1900), *Annual Report, Geol. Survey of Canada, for 1898*, N. S., Vol. 11, 1901.
[Relief in contours.]

6. Pre-emptor's Map [of British Columbia]: Tête Jaune Sheet (No. 3 H). 1:190,080. 53°48′ - 52°41′ N.; 121°10′ - 118°22′ W. Dept. of Lands, British Columbia. Revised to April 3, 1914.
[No relief.]

7. Sectional Map [of Western Canada]: Yellowhead Sheet. 1:190,080. 53°12′ - 52°28′ N.; 120°0′ - 118°0′. Topographical Surveys Branch, Dept. of the Interior, Ottawa. Revised to Oct. 10, 1912.
[Relief of Wheeler's survey in hachuring.]

8. Sketch Map Showing Topography of the Fifteenth Base Line across Ranges 25, 26 and 27, West of 5th Meridian, and Ranges 1 to 8, West of 6th Meridian, Province of Alberta. 1:380,160. [54°4′ - 53°43′ N.; 119°14′ - 117°33′ W.]. Accompanies "Extracts from the Report of A. H. Hawkins, D.L.S.", Appendix No. 21, *Annual Report Topogr. Surveys Branch for 1909-1910*, pp. 84-91, Ottawa, 1911.
[Generalized relief.]

9. Sketch Map of the Sixteenth Base Line across Ranges 5 to 13 and the Seventeenth Base Line across Ranges 9 to 14, West of the 6th Meridian. 1:380,160. [54°-45′ - 54°4′ N.; 120°7′ - 118°30′]. Accompanies, in pocket of report for 1911-12, "Abstract of the Report of George McMillan, D.L S.", Appendix No. 35, *Annual Report Topogr. Surveys Branch for 1910-1911*, pp. 116-118, Ottawa, 1912.
[No relief.]

10. Map of Part of British Columbia and the Northwest Territory from the Pacific Ocean to Fort Edmonton. Sheet II. 1:506,880. 57°8′ - 53°49′ N.; 124°35′ - 117°55′ W. Accompanies "Report of an Exploration from Port Simpson on the Pacific Coast to Edmonton on the Saskatchewan, Embracing a Portion of the Northern Part of British Columbia and the Peace River Country, 1879," by George M. Dawson, Sub-report B (165 pp., 1881), *Report of Progress, Geol. Survey of Canada, for 1879-80*, Montreal, 1881.

11. Northern Alberta: Map Showing Disposition of Lands. Prepared under the direction of F. C. C. Lynch, Superintendent of Railway Lands, [by] J. E. Chalifour, Chief Geographer. 1:792,000. 60°15′ - 52°50′ N.; 120°20′ - 109°15′ W. Dept. of the Interior, Ottawa. Eighth edition, corrected to Sept. 1, 1914.

12. British Columbia. [Compiled under the direction of] G. G. Aitken, Chief Geographer. 1:1,125,000. 61° - 48° N.; 140° - 112½° W. British Columbia Dept. of Lands, Victoria, B. C., 1912.